

Claims

What is claimed is:

- 5 1. An expansible reflector device for a user terminal to extend a surface contour of a user terminal to modify its gain performance to accommodate changing operating conditions and maintain reception of satellite signals when signal quality is degraded, the device comprising:
- a set of reflector extensions movably attached to a standard size reflector having a
- 10 standard surface contour configured for receiving satellite signals, the set of reflector extensions attached to a standard size reflector by a deployment means for extending and retracting the set of reflector extensions, the deployment means adapted for extending the set of reflector extensions outside of a perimeter of a standard size reflector in a configuration which extends the projection of the surface contour of the reflector to
- 15 increase its effective capture area and hence its gain to enable reception of satellite signals when signal quality to a standard size reflector is degraded and the deployment means further adapted for retracting the set of reflector extensions to return a standard size reflector to a standard surface contour when signal quality is satisfactory;
- a sensing means for sensing quality of reception of satellite signals;
- 20 a programmable control means for activating the deployment means, the control means adapted for receiving signals from the sensing means and further adapted for activating the deployment means to alternately extend and retract the set of reflector extensions based on quality of reception of satellite signals.

2. The device of claim 1 wherein the control means is adapted for setting threshold levels of signal quality for extension and retraction of the set of reflector extensions and setting minimum times between events and setting hysteresis and delays to prevent the terminal from cycling between extension and retraction during short intervals of change to make the device responsive without undue cycling.

3. The device of claim 1 wherein the set of reflector extensions comprise curved elements having metallic surface contours adapted for matching and extending the surface contour of a standard reflector when the set of reflector extensions are extended.

4. The device of claim 3 wherein the set of reflector extensions are fabricated of metal.

5. The device of claim 3 wherein the set of reflector extensions are fabricated of a non-metallic material that has been coated with a metallic material on an inside curved surface.

6. The device of claim 5 wherein the set of reflector extensions are fabricated of nylon.

7. The device of claim 5 wherein the set of reflector extensions are fabricated of plastic.

8. The device of claim 1 wherein the deployment means comprises a
5 deployment means taken from the list of deployment means including electro-mechanical, hydraulic, pneumatic, inflation, driving gears, gear trains, levers, pulleys, and any combination of the list of deployment means.

9. The device of claim 1 wherein the set of reflector extensions are attached
10 on a rear surface within an outer perimeter of a standard size reflector.

10. The device of claim 1 wherein the set of reflector extensions are configured to form a complete annular ring around an outer perimeter of a standard size reflector when the set of reflector extensions are extended for full coverage around the
15 perimeter of a standard size reflector.

11. The device of claim 1 wherein the set of reflector extensions are configured to form a broken annular ring around an outer perimeter of a standard size reflector with a space between each adjacent pair of the set of reflector extensions when
20 the set of reflector extensions are extended for partial coverage around the perimeter of a standard size reflector.

12. The device of claim 1 wherein the set of reflector extensions are configured to form curved opposing side panel extensions for coverage on at least two sides of a standard size reflector when the set of reflector extensions are extended.

5 13. The device of claim 1 wherein the sensing means comprises a modem for transmitting received satellite signals to the control, the modem adapted for demodulating and decoding the satellite signals to provide relevant information in the form of estimates of received signal-to-noise ratio and of pre- and post-decoding bit error rates.

10 14. The device of claim 1 wherein the sensing means comprises a precipitation sensor adapted for detecting precipitation and for supplying estimates of precipitation rate to the control.

15 15. The device of claim 1 wherein a reflector is part of a two way system having a link to another user and the sensing means comprises a message detecting means for detecting a message from the other user at the other end of the link sensing a degraded transmission quality and requesting an increase in transmitted power.

20 16. The device of claim 1 wherein the device is fabricated with a standard size reflector and a set of reflector extensions in combination.

17. The device of claim 1 wherein the set of reflector extensions is adapted for attaching to an existing standard size reflector.